1.4 Modeling Issues

The consequences of an accidental chemical release depend on the conditions of the release and the conditions at the site at the time of the release. This guidance provides reference tables of distances, based on results of modeling, for estimation of worst-case and alternative scenario consequence distances. Worst-case consequence distances obtained using these tables are not intended to be precise predictions of the exact distances that might be reached in the event of an actual accidental release. For this guidance, worst-case distances are based on modeling results assuming the combination of worst-case conditions required by the rule. This combination of conditions occurs rarely and is unlikely to persist for very long. To derive the alternative scenario distances, less conservative assumptions were used for modeling; these assumptions were chosen to represent more likely conditions than the worst-case assumptions. Nevertheless, in an actual accidental release, the conditions may be very different.

Users of this guidance should remember that the results derived from the methods presented here are rough estimates of potential consequence distances.

Other models may give different results; the same model also may give different results if different assumptions about release conditions and/or site conditions are used.

The reference tables of distances in this guidance provide results to a maximum distance of 25 miles. EPA recognizes that modeling results at such large distances are highly uncertain. Almost no experimental data or data from accidents are available at such large distances to compare to modeling results. Most data are reported for distances well under 10 miles. Modeling uncertainties are likely to increase as distances increase because conditions (e.g., atmospheric stability, wind speed, surface roughness) are not likely to remain constant over large distances. Thus, at large distances (e.g., greater than about 6 to 10 miles), the modeling results should be viewed as very coarse estimates of consequence distances. EPA believes, however, that the results, even at large distances, can provide useful information for comparison purposes. For example, Local Emergency Planning Committees (LEPCs) and other local agencies can use relative differences in distance to aid in establishing chemical accident prevention and preparedness priorities among facilities in a community. Since worst-case scenario distances are based on modeling conditions that are unlikely to occur, and since modeling of any scenario that results in large distances is very uncertain, EPA strongly urges communities and industry not to rely on the results of worst-case modeling or any modeling that results in very large toxic endpoint distances in emergency planning and response activities. Results of alternative scenario models are apt to provide a more reasonable basis for planning and response.